California Rodent-borne Disease Report

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Prepared and distributed by the Vector-Borne Disease Section
Division of Communicable Disease Control
California Department of Public Health

Hantavirus

RODENT SURVEILLANCE

Results of testing for antibody to Sin Nombre virus (SNV) were reported in January - March, 2010, for rodents collected in the following counties:

Peromyscus spp.

County	*P. boylii*		*P. californicus*		*P. crinitus*		*P. eremicus*		*P. maniculatus*		*P. truei*	
	Pos	Tested	Pos	Tested	Pos	Tested	Pos	Tested	Pos	Tested	Pos	Tested
Napa											0	7
Riverside	0	16	0	19			0	58	0	30		
San Diego	0	1	0	14			0	15	0	5		
California: 2010 YTD	0 / 17		0 / 33				0 / 73		0 / 35		0 / 7	

Surveillance data collected and reported by the Coachella Valley MVCD, Napa Mosquito Abatement District, Riverside County Vector Control, San Diego County Vector Surveillance and Control Program, and the California Department of Public Health Viral and Rickettsial Diseases Laboratory and Vector-Borne DIsease Section

Recent scientific publications

Clay CA, Lehmer EM, Previtali A, St Jeor S, Dearing MD. Contact heterogeneity in deer mice: implications for Sin Nombre virus transmission. *Proc R Soc B* 2009; 276:1305-1312.

Abstract

Heterogeneities within disease hosts suggest that not all individuals have the same probability of transmitting disease or becoming infected. This heterogeneity is thought to be due to dissimilarity in susceptibility and exposure among hosts. As such, it has been proposed that many host-pathogen systems follow the general pattern whereby a small fraction of the population accounts for a large fraction of the pathogen transmission. This disparity in transmission dynamics is often referred to as '20/80 Rule', i.e. approximately 20 per cent of the hosts are responsible for 80 per cent of pathogen transmission. We investigated the role of heterogeneity in contact rates among potential hosts of a directly transmitted pathogen by examining Sin Nombre virus (SNV) in deer mice (Peromyscus maniculatus). Using foraging arenas and powder marking, we documented contacts between wild deer mice in Great Basin Desert, central Utah. Our findings demonstrated heterogeneity among deer mice, both in frequency and in duration of contacts with other deer mice. Contact dynamics appear to follow the general pattern that a minority of the population accounts for a majority of the contacts. We found that 20 per cent of individuals in the population were responsible for roughly 80 per cent of the contacts observed. Larger-bodied individuals appear to be the functional group with the greatest SNV transmission potential. Contrary to our predictions, transmission potential was not influenced by breeding condition or sex.